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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

LAVARIAS, ARNEL C

ART UNIT

PAPER NUMBER

2872

DATE MAILED: 03/13/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/981,500

Applicant(s)

NAULLEAU, PATRICK P.

Examiner

Arnel C. Lavarias

Art Unit

2872

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 30 January 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ 6) ☐ Other:

DETAILED ACTION

Response to Amendment

1. The amendments to the specification of the disclosure in Paper No. 7, dated 1/30/03, are acknowledged and accepted.
2. The declaration filed on 1/30/03 in Paper No. 7 under 37 CFR 1.131 is sufficient to overcome the Suzuki (U.S. Patent Application No. US2002/0018197 A1) reference.

Response to Arguments

3. In view of the amendments to the specification of the disclosure, the objections to the drawings and the specification are respectfully withdrawn.
4. In view of the declaration filed on 1/30/03 in Paper No. 7 under 37 CFR 1.131, the rejections to Claims 1-20 are respectfully withdrawn.
5. Claims 1-20 are now rejected as follows.

Claim Rejections - 35 USC § 102

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

7. Claims 1, 10-11, and 14 are rejected under 35 U.S.C. 102(b) as being anticipated by Shalapenok et al. (U.S. Patent No. 6081381).

Shalapenok et al. discloses an illuminator device for an optical imaging processing system and a method of modifying the coherence of a beam of radiation from a source (See Figure 1), wherein the imaging processing system comprises an optical system requiring partially coherent illumination, and where the illuminator comprises a source of coherent or partially coherent radiation, such as a synchrotron, which has an intrinsic coherence that is higher than the desired coherence (See 10 in Figure 1; col. 4, lines 23-30; col. 9, lines 35-39); a holographic diffuser element having a surface that receives incident radiation from the source (See 14 in Figure 1); means for translating the surface of the holographic element in at least one dimension along a plane that is parallel to the surface of the holographic element wherein the rate of the motion is fast relative to integration time of the image processing system (See 14 in Figure 1; 114 in Figure 3; col. 7, lines 23-27, 63-67); and a condenser optic that re-images the surface of the holographic element to the entrance plane of the image processing system (See 20 in Figure 1). Also, Shalapenok et al. discloses the means for moving the surface of the holographic element causing the surface to move only linearly in the plane of the holographic surface with the proviso that the surface is not rotated (See col. 9, lines 32-34).

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. Claims 2-3 and 12-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shalapenok et al. in view of Bos et al. (U.S. Patent No. 5825448).

Shalapenok et al. discloses the invention as set forth above, except for the coherent or partially coherent radiation being diffracted by the surface of the holographic element to generate diffracted radiation containing diffracted orders of radiation and a zero order of radiation and the illuminator further comprising filtering means to block all but the +1 or the -1 order radiation from reaching the condenser optic. However, Bos et al. teaches a reflective imaging projection system (See Figure 8) wherein a controllable diffractive optical element, which may be lithographically, holographically or interferometrically generated (See 64 in Figure 8; Abstract), generates diffracted radiation containing diffracted orders of radiation from a source (See 52 in Figure 8), and spatial filters or louvers (See 22 in Figure 6) placed near the diffractive optical element may be used to filter out any particular diffraction order or sets of diffraction orders generated by the diffractive optical element (See col. 1, lines 38-54; col. 3, lines 12-39; col. 17, line 62-col. 18, line 14). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have the coherent or partially coherent radiation be diffracted by the surface of the holographic element to generate diffracted radiation containing diffracted orders of radiation and a zero order of radiation and the illuminator further comprise filtering means to block all but the +1 or the -1 order radiation from reaching the condenser optic, as taught by Bos et al., in the illuminator device of Shalapenok et al. for the purpose of improving the transmission efficiency of the optical system.

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10. Claims 8-9, and 19-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shalapenok et al. in view of Makabe et al. (U.S. Patent No. 4945551).

Shalapenok et al. disclose the invention as set forth above in Claims 1 and 11, except for the condenser optic being a single, spherically reflective element. However, Makabe et al. teaches a soft x-ray lithographic system (See Figure 1) wherein the condenser optic (See 2 in Figure 1) is a single, spherically reflective element (See col. 3, lines 8-17).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have the condenser optic be a single, spherically reflective element, such as a spherically concave reflector as taught by Makabe et al., in the illuminator device for an optical imaging processing system and a method of modifying the coherence of a beam of radiation from a source as disclosed by Shalapenok et al. One would have been motivated to do this to reduce the number of optical elements in the system, thus increasing the overall efficiency and light throughput (this factor being particularly important since source wavelengths of 1-100 nm are being considered and most optical materials are highly absorbing at these wavelengths).

11. Claims 4-5, and 15-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shalapenok et al. in view of Kathman et al. (U.S. Patent No. 6118559).

Shalapenok et al. disclose the invention as set forth above in Claims 1 and 11, except for the holographic diffuser being a binary phase or amplitude device. However, Kathman et al. teaches holographic diffractive optical diffusers having binary phase and/or amplitudes (See for example Figures 1 or 2; col. 1, lines 23-62) for applications requiring a large band of design wavelengths and very low zero order efficiency.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have the holographic diffuser be a binary phase or amplitude device, as taught by Kathman et al., in the illuminator device for an optical imaging processing system and a method of modifying the coherence of a beam of radiation from a source as disclosed by Shalapenok et al. One would have been motivated to do this to reduce or eliminate the zero order diffraction for the designed source wavelength (i.e. the synchrotron emission wavelength).

12. Claims 6-7, and 17-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shalapenok et al. in view of Hamano et al. (U.S. Patent Application No. US2002/0001109 A1).

Shalapenok et al. disclose the invention as set forth above in Claims 1 and 11, except for the holographic diffuser being a blazed phase device quantized to between 3 and 8 levels. However, Hamano et al. teaches a holographic diffuser that is blazed and quantized between 3 and 8 levels (See for example Figures 17, 18, 23a, 23b, 24a-e; Paragraphs 0176-0184, 0223-0235) for applications in display and imaging systems. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have the holographic diffuser be a blazed phase device quantized to between 3 and 8 levels, as taught by Hamano et al., in the illuminator device for an optical imaging processing system and a method of modifying the coherence of a beam of radiation from a source as disclosed by Shalapenok et al. One would have been motivated to do this to adjust the wavelength of maximum diffraction efficiency, as well as maximize the diffraction efficiency of the diffuser.

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Conclusion

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Arnel C. Lavarias whose telephone number is 703-305-4007. The examiner can normally be reached on M-F 8:30 AM - 5 PM.

The fax phone numbers for the organization where this application or proceeding is assigned are 703-308-7722 for regular communications and 703-308-7722 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-1782.



Arnel C. Lavarias
March 5, 2003

